Kramer Electronics, Ltd.

USER MANUAL

Model:

466N

Digital Audio Transcoder

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1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront the video, audio, presentation, and broadcasting professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 1,000-plus different models now appear in 11 groups[1] that are clearly defined by function.

Congratulations on purchasing your Kramer **466N** *Digital Audio Transcoder*. This product is ideal for the following typical applications:

- Video production and duplication studios
- Audio recording studios
- Live broadcasting and editing

The package includes the following items:

- **466N** *Digital Audio Transcoder*
- Power adapter (5V DC)
- This user manual[2]

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high-performance high-resolution cables[3]

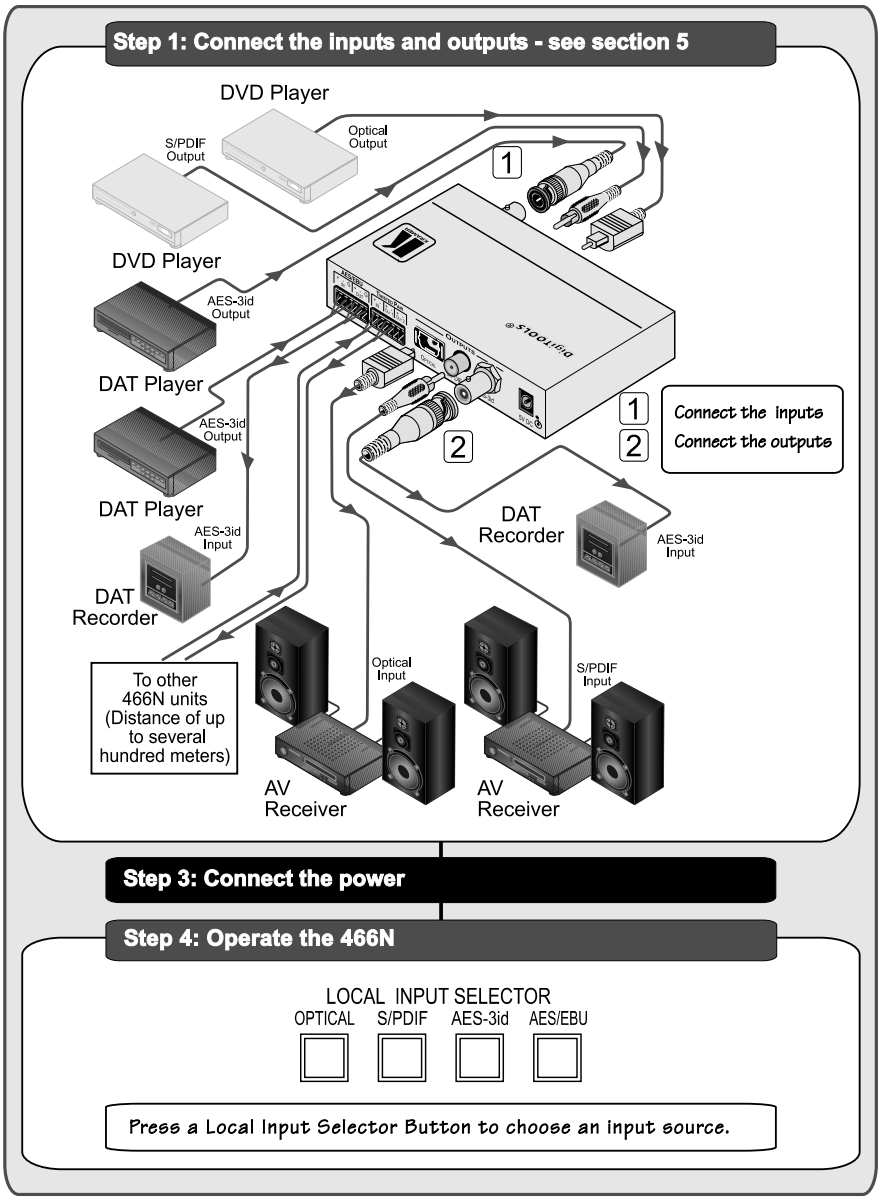
1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Twisted-Pair Solutions; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products

2 Download up-to-date Kramer user manuals and software from our Web site at http://www.kramerelectronics.com

3 The complete list of Kramer cables is on our Web site at http://www.kramerelectronics.com

2.1 Quick Start

This quick start chart summarizes the basic setup and operation steps.



3 Overview

The **466N** is a high-performance transcoder for digital audio signals. It converts 1 of 4 digital audio formats or 1 twisted pair input to 4 digital audio formats and 2 twisted pair outputs simultaneously.

The **466N** has the following inputs and outputs:

- Professional balanced 110Ω AES/EBU on detachable terminal block connectors
- AES-3id 75Ω on BNC connectors
- Consumer 75Ω S/PDIF on RCA connectors
- Optical TOSLINK® in and out connectors
- One twisted pair input
- Two twisted pair outputs

More specifically:

- When an input is selected, all the outputs are available simultaneously
- All inputs and outputs are capable of receiving and transmitting up to 24-bit, 192kHz digital audio, including multi-channel audio
- A twisted pair input and two identical twisted pair outputs enable an extensive cascade of branching to provide multiple outputs over a long distance
- The system bit can be set to professional or consumer status, while all the other system bits remain the same

The **466N** *Digital Audio Transcoder*:

- Can transmit the highest quality digital audio over several hundred meters when several **466N** units are used – one as a transmitter and one or more as receivers
- Has transformer-coupled AES/EBU and AES-3id inputs and outputs
- Accepts all serial digital audio transmission standards, compliant with IEC 60958, S/PDIF, EIAJ CP1201 and AES/EBU interface standards, as well as multi-channel standards
- Is 5V DC fed and is housed in a DigiTOOLS® enclosure

To achieve the best performance:

- Use only good quality connection cables[1] to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables).
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality and position your Kramer **466N** away from moisture, excessive sunlight and dust
- Close the connectors of the optical cables (when not in use) to protect them against exposure to dirt and dust

Caution – No operator-serviceable parts inside unit.

Warning – Use only the Kramer Electronics input power wall adapter that is provided with this unit[2].

Warning – Disconnect power and unplug unit from wall before installing or removing device or servicing unit.

3.1 Shielded and Unshielded Twisted Pair Cables

The decision whether to use shielded twisted pair cable or unshielded twisted pair cable depends on the nature of the application.

In applications with high interference, shielded twisted pair cable gives better results. However, the shield itself creates a capacitance that degrades the frequency response of the machines. For shorter distances, of approximately 50 meters, shielded twisted pair cable is preferred because it provides protection from interference and degradation is non-apparent.

For a long-range application, unshielded twisted pair cable is preferred. However, the unshielded twisted pair cable should be installed far away from electric cables, motors etc., which create electrical interference.

1 Available from Kramer Electronics on our Web site at http://www.kramerelectronics.com

2 For example, part number 2535-052002

4 Your 466N Digital Audio Transcoder

Figure 1 and *Table 1* define the **466N** *Digital Audio Transcoder*, *Figure 2* and *Table 2* define the underside features:

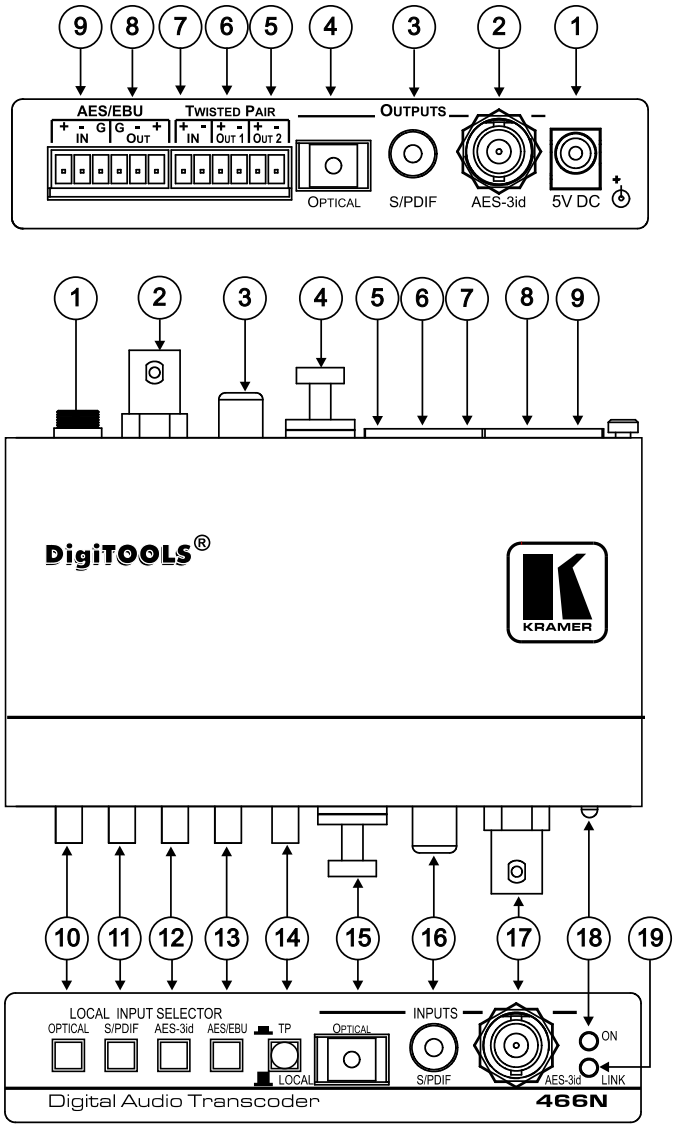


Figure 1: 466N Digital Audio Transcoder

Table 1: Features and Functions of the 466N Digital Audio Transcoder

#	Feature		Function
1	*5V DC*		+5V DC connector for powering the unit
2	*OUTPUTS*	*AES-3id* BNC Connector	Connect to the digital audio acceptor (75Ω)
3		*S/PDIF* RCA Connector	Connect to the digital audio acceptor (S/PDIF)
4		*OPTICAL* TOSLINK® Connector	Connect to the optical audio acceptor
5	*TWISTED PAIR*[1]	*OUT2* Detachable Terminal Block	Connect to an additional **466N** receiver
6		*OUT1* Detachable Terminal Block	Connect to an additional **466N** receiver
7		*IN* Detachable Terminal Block	Connect to the OUT1 or OUT2 detachable terminal block on another (transmitter) **466N** unit, when using more than one **466N** unit (transmitter/receivers)
8	*AES/EBU*	*OUT* Detachable Terminal Block	Connect to the digital audio acceptor
9		*IN* Detachable Terminal Block	Connect to the digital audio source
10	*LOCAL INPUT SELECTOR*	*OPTICAL* Button	Press to select the optical input source
11		*S/PDIF* Button	Press to select the S/PDIF source
12		*AES-3id* Button	Press to select the AES-3id source
13		*AES/EBU* Button	Press to select the AES/EBU source
14	*TWISTED PAIR / LOCAL* Push Button		Release the button, to the LOCAL position, if a single unit is used, or the unit is to operate as a transmitter[2] Push the button in, to the TWISTED PAIR position, if the unit operates as a receiver
15	*INPUTS*	*OPTICAL* TOSLINK® Connector	Connect to the optical audio source
16		*S/PDIF* RCA Connector	Connect to the digital audio source (S/PDIF)
17		*AES-3id* BNC Connector	Connect to the digital audio source (75Ω)
18	*ON* LED		Lights red when the system is powered
19	*LINK* LED		Lights green when the input is connected and the signal is of good quality and can be decoded

1 When connecting a single machine, this section is not relevant

2 See *Figure 4*

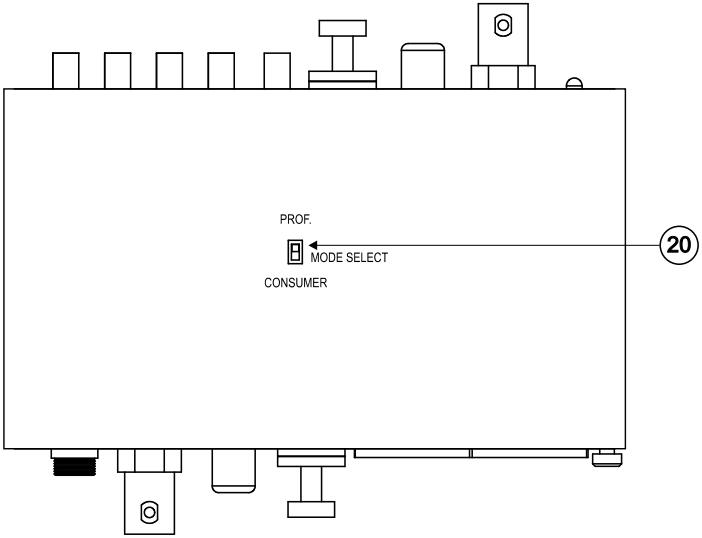


Figure 2: 466N Digital Audio Transcoder Underside Mode Selection Switch

Table 2: 466N Underside Features

#	Feature	Function
20	*MODE SELECT* Switch	Slide up to set to *PROF* (professional) or slide down to set to *CONSUMER* to change the system bit[1]

1 For example, when connecting a consumer source (a DVD player) and outputting to a professional acceptor (a DAT recorder), it may be necessary to change the system bit status by altering the selected PROF./CONSUMER mode

5 Connecting the 466N Digital Audio Transcoder

To connect a single **466N** *Digital Audio Transcoder* machine, as the example in *Figure 3* illustrates[1], do the following[2]:

1. Connect the sources as follows:
   - Connect a digital audio source (for example, a DAT player) to the AES-3id INPUT BNC connector
   - Connect a digital audio source (for example, a DVD player) to the S/PDIF INPUT RCA connector
   - Connect a digital audio source (for example, a DVD player) to the OPTICAL INPUT TOSLINK® connector
   - Connect an AES/EBU source (for example, a DAT player) to the AES/EBU detachable terminal block IN connector using a shielded twisted pair cable
2. Connect the acceptors as follows:
   - Connect the OPTICAL OUTPUT TOSLINK® connector to a digital audio acceptor (for example, an AV receiver)
   - Connect the S/PDIF OUTPUT RCA connector to a digital audio acceptor (for example, an AV receiver)
   - Connect the AES-3id OUTPUT BNC connector to a digital audio acceptor (for example, a DAT recorder)
   - Connect the AES/EBU detachable terminal block OUT connector (using a shielded twisted pair cable) to an AES/EBU acceptor (for example, a DAT recorder)
3. Connect the 5V DC power adapter to the power socket and connect the adapter to the mains electricity.
4. Release the TWISTED PAIR/LOCAL button to the LOCAL position.
5. Set the MODE SELECT switch button to PROF. or CONSUMER, as required (see *Figure 2*).
6. Press one of the LOCAL INPUT SELECTOR buttons to select an input source[3].
   This source appears on all outputs simultaneously.

1 You do not have to connect all inputs and outputs, connect only those that are required

2 Switch OFF the power on each device before connecting it to your 466N. After connecting your 466N, switch on its power and then switch on the power on each device

3 If the valid digital audio signal is present on the selected input, the green LINK LED lights

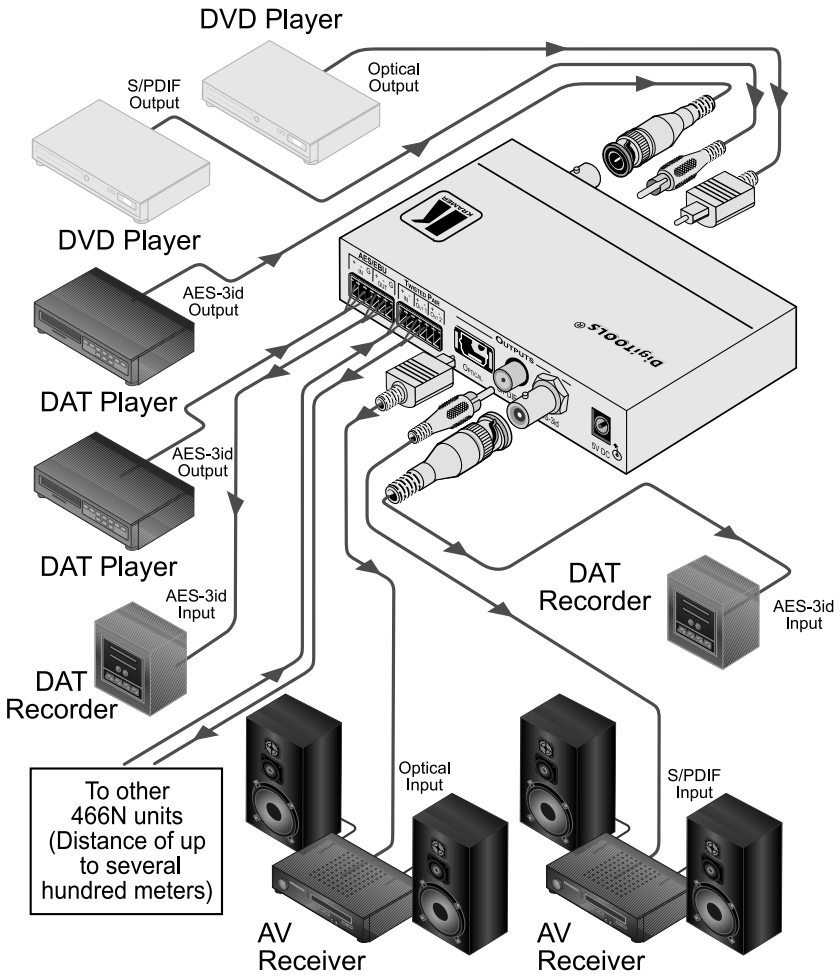


Figure 3: Connecting the 466N Digital Audio Transcoder

6 Cascading Machines

You can cascade several machines via the TWISTED PAIR detachable terminal blocks (OUT1, OUT2, and IN), to extend the range of the output signals over several hundred meters.

To use several machines[1], as illustrated in *Figure 4*, do the following[2]:

1. Connect the first **466N** unit (the Transmitter[3] in *Figure 4*) as described in section 0.
2. Connect Receiver[4] # 1 (in *Figure 4*):
   - Connect the outputs, as described in section 5
   - Push in the TWISTED PAIR/LOCAL button to the TWISTED PAIR position
   - Connect the TWISTED PAIR OUT 1 detachable terminal block, on the Transmitter, to the TWISTED PAIR IN detachable terminal block on Receiver # 1, via a shielded twisted pair cable
   - Set the MODE SELECT switch button to PROF. or CONSUMER, as required (see *Figure 2*)
3. Connect Receiver[4] # 2 (in *Figure 4*):
   - Connect the outputs, as described in section 5
   - Push in the TWISTED PAIR/LOCAL button to the TWISTED PAIR position
   - Connect the TWISTED PAIR OUT 2 detachable terminal block, on the Transmitter, to the TWISTED PAIR IN detachable terminal block on Receiver # 2, via a shielded twisted pair cable
   - Set the MODE SELECT switch button on each **466N** unit to PROF. or CONSUMER, as required (see *Figure 2*)
4. Press one of the LOCAL INPUT SELECTOR buttons to select an input source[5]. This source appears on all outputs simultaneously.

To operate any of the connected units locally,
connect the desired inputs to that unit and
release the TWISTED PAIR/LOCAL button to the LOCAL position.

1 Switch OFF the power on each device before connecting it to your 466N. After connecting your 466N, switch on its power and then switch on the power on each device

2 You do not have to connect all inputs and outputs, connect only those that are required

3 This 466N unit is operating as a transmitter in this configuration

4 This 466N unit is operating as a receiver in this configuration

5 If the valid digital audio signal is present on the selected input, the green LINK LED lights

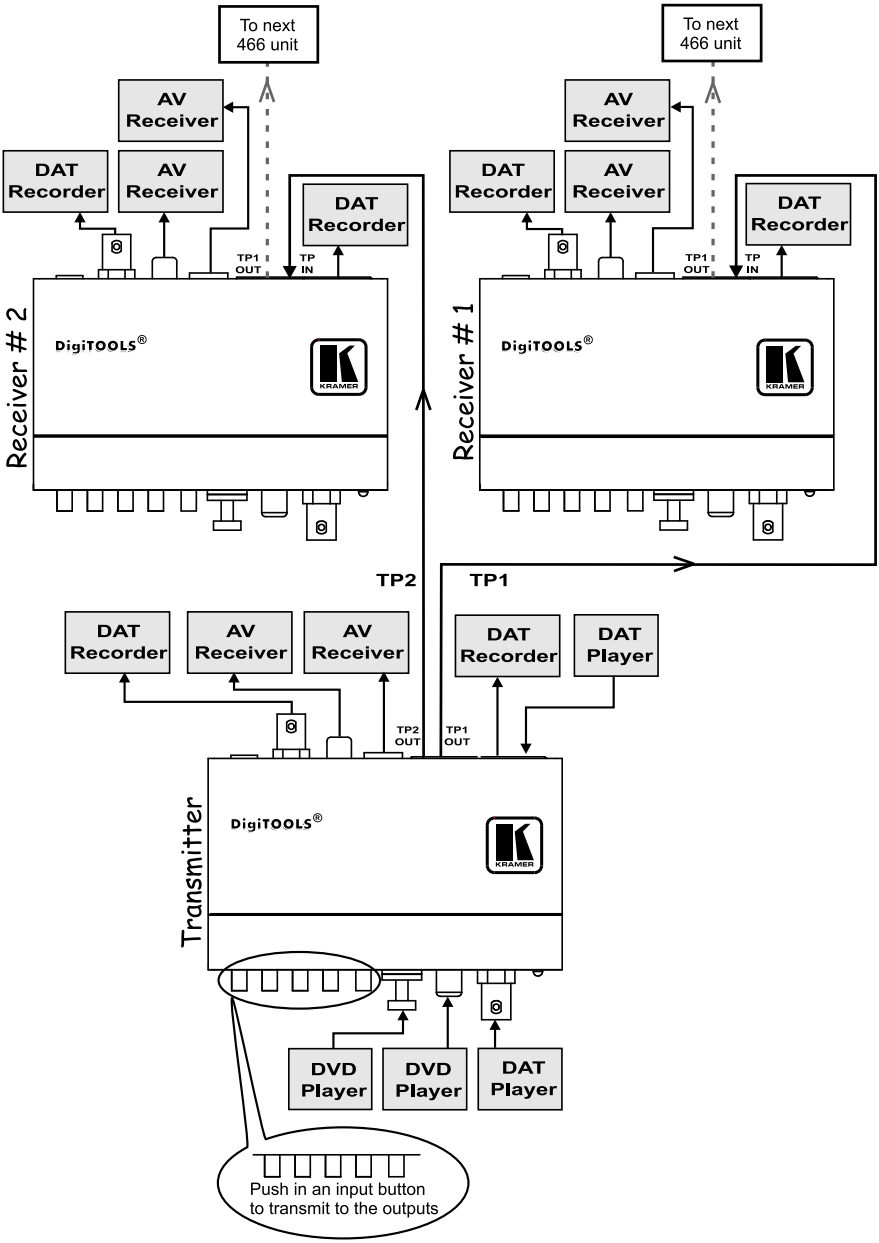


Figure 4: Extending the Range with the 466N Digital Audio Transcoder

6.1 Using Additional 466N Machines

You can connect additional **466N** units (operating as receivers) to further extend the output signal range.

To use additional **466N** machines, do the following:

1. Connect the required outputs[1] to the newly added **466N** receiver unit.
2. Connect the TWISTED PAIR OUT 1 and/or OUT 2 detachable terminal blocks of the previously connected unit, to the TWISTED PAIR IN detachable terminal block on the newly added unit, using a shielded twisted pair cable.
3. Push in the TWISTED PAIR/LOCAL button on the new machine, to the TWISTED PAIR position[2].
4. Set the MODE SELECT switch button on each **466N** unit to PROF. or CONSUMER, as required (see *Figure 2*).
5. Press one of the LOCAL INPUT SELECTOR buttons to select an input source[3].
   This source appears on all outputs simultaneously.

When connecting several machines, push in the TWISTED PAIR/LOCAL button on all receiver units, except for the transmitter unit.

1 You do not have to connect all the outputs

2 Push in the TWISTED PAIR/LOCAL button on each unit except for the first machine (to which the inputs are connected).

3 If the valid digital audio signal is present on the selected input, the green LINK LED lights

7 Technical Specifications

Table 3 includes the technical specifications:

Table 3: Technical Specifications[1] of the 466N Digital Audio Transcoder

INPUTS:	1 digital audio AES-3id on a BNC connector, 1 S/PDIF digital audio on an RCA connector, 1 TOSLINK® optical, 1 balanced digital audio AES/EBU on a detachable terminal block, 1 twisted pair on a detachable terminal block
OUTPUTS:	1 digital audio AES-3id on a BNC connector, 1 S/PDIF digital audio on an RCA connector, 1 TOSLINK® optical, 1 balanced digital audio AES/EBU on a detachable terminal block, 2 twisted pairs on detachable terminal blocks
SAMPLING:	32, 44.1, 48, 96, 192kHz sampling frequencies
STANDARDS:	IEC 60958, S/PDIF, EIAJ CP1201 and AES/EBU interface standards, as well as multi-channel standards
CONTROL:	Input select, local or twisted-pair selector, system bit selector
POWER SOURCE:	5V DC, 60mA
DIMENSIONS:	12cm x 7.5cm x 2.5cm (4.7" x 2.95" x 0.98") W, D, H
WEIGHT:	0.25 kg (0.6 lbs.) approx.
ACCESSORIES:	Power supply, mounting bracket
OPTIONS:	RK-T1 or RK-T3 19” rack adapters

1 Specifications are subject to change without notice

LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for seven years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the Web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed, or on which the WARRANTY VOID IF TAMPERED sticker has been torn, reattached, removed or otherwise interfered with.
3. Damage, deterioration or malfunction resulting from:
   i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
   ii) Product modification, or failure to follow instructions supplied with the product
   iii) Repair or attempted repair by anyone not authorized by Kramer
   iv) Any shipment of the product (claims must be presented to the carrier)
   v) Removal or installation of the product
   vi) Any other cause, which does not relate to a product defect
   vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

EN-50081:	"Electromagnetic compatibility (EMC); generic emission standard. Part 1: Residential, commercial and light industry"
EN-50082:	"Electromagnetic compatibility (EMC) generic immunity standard. Part 1: Residential, commercial and light industry environment".
CFR-47:	FCC* Rules and Regulations: Part 15: "Radio frequency devices Subpart B Unintentional radiators"

CAUTION!

- Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- Use the supplied DC power supply to feed power to the machine.
- Please use recommended interconnection cables to connect the machine to other components.

* FCC and CE approved using STP cable (for twisted pair products)

For the latest information on our products and a list of Kramer distributors, visit our Web site: www.kramerelectronics.com where updates to this user manual may be found.
We welcome your questions, comments and feedback.

Safety Warning:
Disconnect the unit from the power supply before opening/servicing.

Kramer Electronics, Ltd.
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P/N: 2900-000411 REV 1